

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (currently amended): A misfire detecting apparatus for an internal combustion engine, comprising:

an operating condition detector that is configured to detect ~~detecting~~ engine operating conditions inclusive of an engine rotation speed; and

a calculating section that is configured to:

~~judges whether or not a misfire occurred, based on the engine rotation speed detected by said operating condition detector, to output a misfire judgment signal, wherein said calculating section:~~

~~calculates diagnosis data indicating a variation of said engine rotation speed and also calculates speed;~~

~~calculates a threshold based on said engine operating conditions, and judges conditions;~~

~~judges whether or not a misfire occurred, based on a first comparison the comparison between the calculated said diagnosis data and the calculated said threshold; and also threshold;~~

~~calculates data indicating an average correlation between said calculated diagnosis data and said threshold, calculated threshold;~~

~~judges whether said calculated diagnosis data becomes larger on average on the basis of said calculated threshold, based to cancel the misfire judgment, based on a result of a second comparison the comparison between said data indicating the average correlation and a threshold for cancellation judgment; and~~

cancel the misfire judgment as a result of the second comparison.

2. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 1, wherein said calculating section is also configured to calculate ~~calculates~~ a ratio between an average value of said diagnosis data and an average value of said threshold, as said data indicating the average correlation.

3. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 1, wherein said calculating section is also configured to calculate ~~calculates~~ an average value of ratios between said diagnosis data and said threshold, as said data indicating the average correlation.

4. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 1, wherein said calculating section is also configured to calculate ~~calculates~~ said threshold for cancellation judgment according to an engine load and the engine rotation speed.

5. (currently amended): A misfire detecting apparatus for an internal combustion engine ~~according to claim 1, comprising:~~

an operating condition detector that is configured to detect engine operating conditions inclusive of an engine rotation speed; and
a calculating section that is configured to:
judge whether a misfire occurred, based on the engine rotation speed detected by said operating condition detector;
output a misfire judgment signal;
calculate diagnosis data indicating a variation of said engine rotation speed;
calculate a threshold based on said engine operating conditions;
judge whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;
calculate data indicating an average correlation between said diagnosis data and said threshold, to cancel the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and
eliminate wherein said calculating section eliminates said diagnosis data and said threshold for when when said diagnosis data is equal to or above said threshold, from samples for calculating said data indicating the average correlation.

6. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 5, wherein said calculating section is also configured to prohibit prohibits the cancellation of the misfire judgment on the basis of said data indicating the average correlation, when the number of samples of said diagnosis data and said threshold used for the calculation of said data indicating the average correlation is less than a predetermined value.

7. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 1, comprising:

an operating condition detector that is configured to detect engine operating conditions inclusive of an engine rotation speed; and
a calculating section that is configured to:
judge whether a misfire occurred, based on the engine rotation speed detected by said operating condition detector;
output a misfire judgment signal;
calculate diagnosis data indicating a variation of said engine rotation speed;
calculate a threshold based on said engine operating conditions;
judge whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;
calculate data indicating an average correlation between said diagnosis data and said threshold, to cancel the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and
prohibit wherein said calculating section prohibits the cancellation of the misfire judgment, when a misfire frequency during a period of time where in which said average correlation is obtained, is equal to or above a predetermined value.

8. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 1, comprising:

an operating condition detector that is configured to detect engine operating conditions inclusive of an engine rotation speed; and
a calculating section that is configured to:
judge whether a misfire occurred, based on the engine rotation speed detected by said operating condition detector;
output a misfire judgment signal;
calculate diagnosis data indicating a variation of said engine rotation speed;
calculate a threshold based on said engine operating conditions;
judge whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;
calculate data indicating an average correlation between said diagnosis data and said threshold, to cancel the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and
obtain wherein said calculating section obtains said data indicating the average correlation, as an average value per the predetermined number of ignitions.

9. (currently amended): A misfire detecting apparatus for an internal combustion engine according to claim 8, wherein said calculating section is also configured to:

accumulate the misfire frequency per said predetermined number of ignitions by the predetermined number of times, to output the misfire judgment signal when said accumulated value is equal to or above a predetermined value, and also value; and
prohibit prohibits an output of the misfire judgment signal on the basis of said accumulated value, based on the result of the second comparison between said data indicating the average correlation and said threshold for cancellation judgment.

10. (currently amended): A misfire detecting apparatus for an internal combustion engine, comprising:

means for detecting engine operating conditions inclusive of an engine rotation speed;
means for calculating diagnosis data indicating a variation of said engine rotation speed;
means for calculating a threshold based on said engine operating conditions;
means for judging whether ~~or not~~ a misfire occurred, based ~~on the~~ a first comparison between said calculated diagnosis data and said calculated threshold;
means for calculating data indicating an average correlation between said calculated diagnosis data and said ~~threshold; and~~ calculated threshold;
means for judging whether said calculated diagnosis data becomes larger on average on the basis of said calculated threshold, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and;
means for canceling the misfire judgment, ~~based on a result of the comparison between said data indicating the average correlation and a threshold for cancellation judgment as a result of the second comparison.~~

11. (currently amended): A misfire detecting method for an internal combustion engine, comprising the steps of:

detecting engine operating conditions inclusive of an engine rotation speed;
calculating diagnosis data indicating a variation of said engine rotation speed;
calculating a threshold based on said engine operating conditions;
judging whether ~~or not~~ a misfire occurred, based ~~on the~~ on a first comparison between said calculated diagnosis data and said calculated threshold;
calculating data indicating an average correlation between said calculated diagnosis data and said ~~threshold; and~~ calculated threshold;
judging whether said calculated diagnosis becomes larger on average on the basis of said calculated threshold, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and
canceling the misfire judgment, ~~based on a result of the comparison between said data indicating the average correlation and a threshold for cancellation judgment as a result of the second comparison.~~

12. (currently amended): A misfire detecting method for an internal combustion engine according to claim 11, wherein said step of calculating the data indicating the average ~~correlation; correlation comprises the step of:~~

~~calculating calculates~~—a ratio between an average value of said diagnosis data and an average value of said threshold, as said data indicating the average correlation.

13. (currently amended): A misfire detecting method for an internal combustion engine according to claim 11, wherein said step of calculating the data indicating the average ~~correlation; correlation comprises the step of:~~

~~calculating calculates~~—an average value of ratios between said diagnosis data and said threshold, as said data indicating the average correlation.

14. (currently amended): A misfire detecting method for an internal combustion engine according to claim 11, further comprising the ~~step of; step of:~~

calculating said threshold for cancellation judgment according to an engine load and the engine rotation speed.

15. (currently amended): A misfire detecting method for an internal combustion engine ~~according to claim 11, comprising the steps of:~~

~~detecting engine operating conditions inclusive of an engine rotation speed;~~
~~calculating diagnosis data indicating a variation of said engine rotation speed;~~
~~calculating a threshold based on said engine operating conditions;~~
~~judging whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;~~
~~calculating data indicating an average correlation between said diagnosis data and said threshold; and~~
~~canceling the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment,~~

wherein said step of calculating the data indicating the average ~~correlation; correlation comprises the step of:~~

~~eliminating eliminates~~—said diagnosis data and said threshold ~~for when when~~ said diagnosis data is equal to or above said threshold, from samples for calculating said data indicating the average correlation.

16. (currently amended): A misfire detecting method for an internal combustion engine according to claim 15, further comprising the step of; step of:

prohibiting the cancellation of the misfire judgment on the basis of said data indicating the average correlation, when the number of samples of said diagnosis data and said threshold used for the calculation of said data indicating the average correlation is less than a predetermined value.

17. (currently amended): A misfire detecting method for an internal combustion engine according to claim 11, further comprising the step of; comprising the steps of:

detecting engine operating conditions inclusive of an engine rotation speed;
calculating diagnosis data indicating a variation of said engine rotation speed;
calculating a threshold based on said engine operating conditions;
judging whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;
calculating data indicating an average correlation between said diagnosis data and said threshold;
canceling the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment; and
prohibiting the cancellation of the misfire judgment, when a misfire frequency during a period of time where in which said average correlation is obtained, is equal to or above a predetermined value.

18. (currently amended): A misfire detecting method for an internal combustion engine according to claim 11, comprising the steps of:

detecting engine operating conditions inclusive of an engine rotation speed;
calculating diagnosis data indicating a variation of said engine rotation speed;
calculating a threshold based on said engine operating conditions;
judging whether a misfire occurred, based on a first comparison between said diagnosis data and said threshold;
calculating data indicating an average correlation between said diagnosis data and said threshold, wherein said step of calculating the data indicating the average correlation; correlation comprising the step of:
calculating calculates said data indicating the average correlation, as an average value per the predetermined number of ignitions; and
cancelling the misfire judgment, based on a result of a second comparison between said data indicating the average correlation and a threshold for cancellation judgment.

19. (currently amended): A misfire detecting method for an internal combustion engine according to claim 18,

wherein said step of judging whether or not a misfire occurred comprises the steps of:
accumulating the misfire frequency per said predetermined number of ignitions by the predetermined number of times; and
outputting the misfire a misfire judgment signal when said accumulated value is equal to or above a predetermined value, and
wherein said step of canceling the misfire judgment; judgment comprises the step of: prohibiting prohibits an output of the misfire judgment signal on the basis of said accumulated value, based on the result of the second comparison between said data indicating the average correlation and said threshold for cancellation judgment.